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Notes on Geographic Distribution

An unexpected record of *Teratohyla midas* (Lynch and Duellman, 1973) for Brazil reveals the presence of glassfrogs in the Brazilian northern lowlands (Anura: Centrolenidae)

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Abstract: We reported a new record of *Teratohyla midas* for Northeast Brazil and extending its distribution in 1,200km east from the nearest reported area. Additionally we constructed a distribution map based on literature records. Previously to this study, this species was known to occur in Ecuador, Peru, Colombia, Brazil (states of Amazonas and Rondônia), and an isolated population in French Guyana. Also, this record represents the first for Centrolenidae in transitional forests between Cerrado and Amazon biomes.

Glassfrogs (family Centrolenidae Taylor, 1951) are conspicuous inhabitants of Neotropical forests where they usually occur along streams and creeks (Cisneros-Heredia and McDiarmid 2007). Presently, 152 species are recognized in this monophyletic group from Central America, tropical Andean region, and in the Guyana Shield (Castroviejo-Fisher *et al*. 2011; Guayasamin *et al*. 2009; Frost 2013); however, an isolated group inhabits the Atlantic Forest biome from Southeastern Brazil to adjacent Argentina (Heyer 1985).

Teratohyla midas (Lynch and Duellman, 1973), which was described from Santa Cecília, province of Napo, Ecuador, have most records reported for Amazonian Basin of Northeastern Ecuador, Peru and Colombia (Lynch and Duellman 1973; Cisneros-Heredia and McDiarmid 2005; França and Venâncio 2010; Malambo *et al.* 2013; Melo-Sampaio and Oliveira 2013). Furthermore, Kok and Castroviejo-Fisher (2008) documented this species for Crique Grand Leblond, French Guyana, the northernmost record. Nevertheless, authors flagged its occurrence as presumable for Northwestern Brazil and Southeastern Colombia (Rodríguez *et al*. 2012; Frost 2013). According to the original description (Lynch and Duellman 1973), *T. midas* is characterized by the following traits: 1) 1-3 prevomerine teeth; (2) green bones in life; (3) parietal peritoneum is white and visceral peritoneum opaque; (4) in preservative dorsal coloration is lavender with white flecks; (5) extensive webbing between third and fourth fingers; (6) snout truncate in dorsal view and profile; (7) skin texture shagreen; (8) absence of dermal folds in forearms and hind limbs; and (9) lower two thirds of tympanum is visible and posteriorly oriented.

While examining a collection of centrolenid specimens from the Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), we found a specimen (Figure 1) of *Teratohyla midas* (MNRJ 23856) labeled as *Vitreorana oyampiensis* (Lescure 1975). The specimen is an adult male, SVL 19.5 mm, collected at Municipality of São Pedro da Água Branca (05°05'06"S, 48°25'45"W; 160 m.a.s.l. WGS84), State of Maranhão, by G.V. Andrade and J.D. Lima on May 1998. This area is characterized by transitional forests between Amazon and Cerrado biomes (Veloso *et al*. 1991). This area is composed of both open savannas and forests, which are associated with rivers (*Cerradão* and *Mata dos Cocais*), which, by their turn, are influenced by the Tocantins and Araguaia rivers drainages systems.

We identified the referred specimen as *Teratohyla midas* based on known characters (Lynch and Duellman 1973, Guayasamin *et al*. 2009) and comparisons with photographs of the holotype (KU 123219).

This new record extends the known geographic range of *Teratohyla midas* approximately 1200 km southeast from the nearest reported area (Crique Grand Leblond, French Guyana [Kok and Castroviejo-Fisher 2008]) being the easternmost record for this glassfrog. Also, this record represents the first for glassfrogs in the transitional area between Amazon and Cerrado biome. Hence, *T. midas* geographic distribution is associated to Peruvian, Ecuadorian, Colombian and Brazilian Amazonian lowlands and a disjoint populations occurring in French Guyana, and northern Brazilian lowlands, at transitional forested remnants between Amazon and Cerrado in Tocantins River drainage systems (Figure 2).

Kok and Castroviejo-Fisher (2008) emphasized that the disjoint distribution of *Teratohyla midas* is an artifact due to the lack of sample effort across the Amazon Basin and Guyana Shield. An increase in sampling effort in these areas may reveal the presence of this species in other forested fragments, thus filling its distributional gap. Another hypothesis raised by those authors, is that *T. midas* corresponds to a species complex. However, only studies conducted in view of fresh collected specimens, bioacustical, and molecular data will reveal if unrecognized species are contained within *T. midas.*

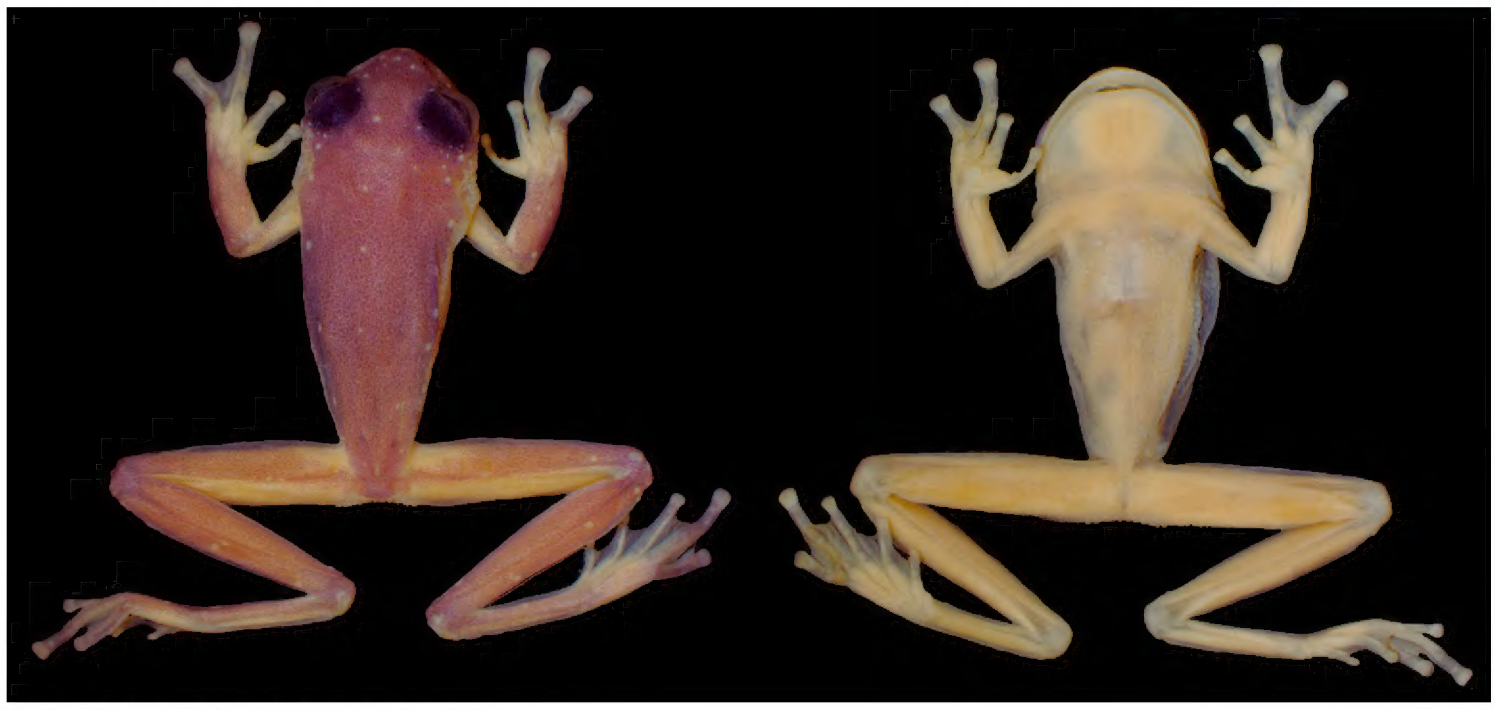

Figure 1. *Teratohyla midas* (MNRJ 23856). SVL 19.5 mm.

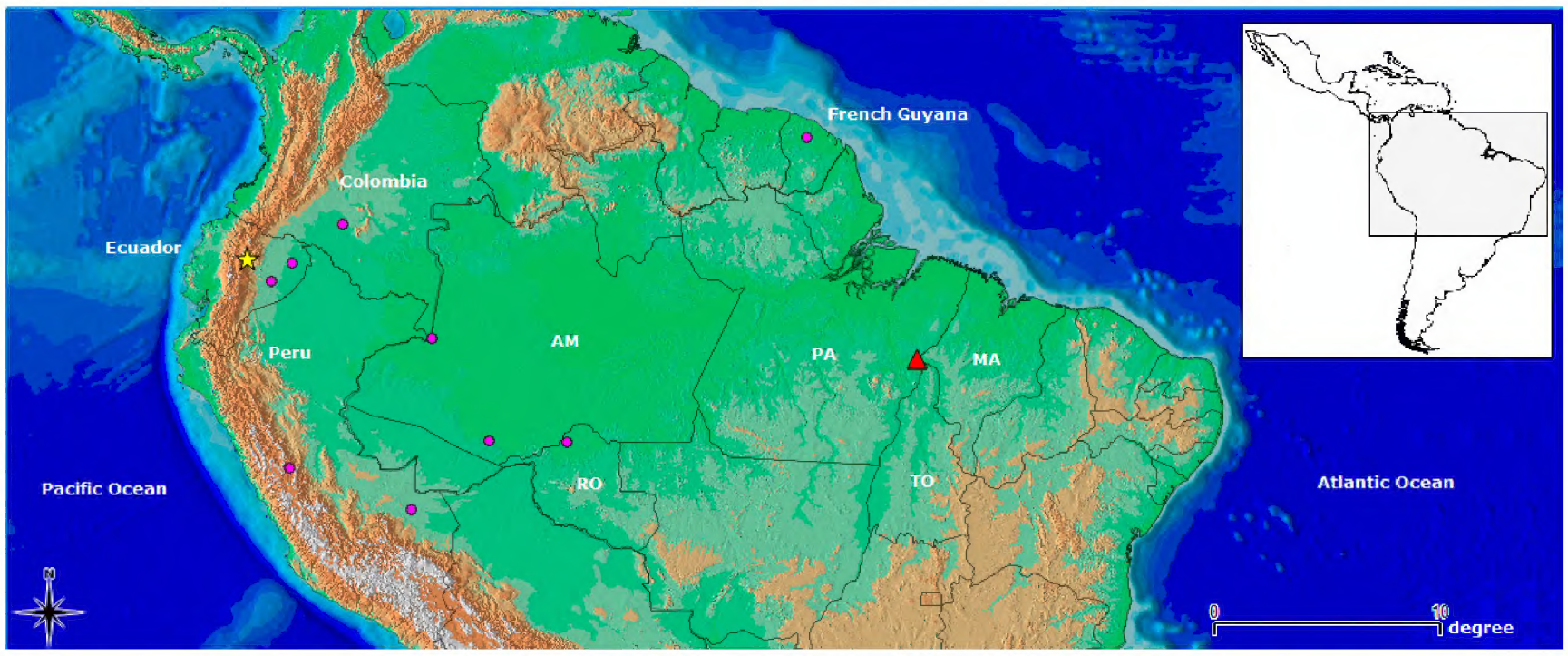

Figure 2. Distribution map of *Teratohyla midas*. Yellow star: type-locality (Santa Cecília, Província de Napo, Ecuador); Pink circle: literature records - Rodriguez *et al.* 2004 (Panguana, Departament of Huánuco and Pakitza Department of Madre de Dios, Peru) Cisneros-Heredia and McDiarmid 2005 (Province of Orellana, Napo, and Pastaza, Ecuador); Lynch 2005 (Letícia, Department of Amazonas, Colombia); Kok and Castroviejo-Fisher 2008 (Crique Grand Leblond, French Guyana); França and Venâncio 2010 (Boca do Acre, estado do Amazonas, Brazil); Melo-Sampaio and Oliveira 2013 (Porto Velho, Rondônia, Brazil); Malambo *et al.* 2013 (Belén de los Andaquies and Florencia Department of Caquetá, Colombia); red triangle: new record for São Pedro da Água Branca, Maranhão, Brazil.

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